WHAT IS CLAIMED IS:

1.   A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for providing accelerated data storage and retrieval, said method steps comprising:

5   receiving a data stream at an input data transmission rate which is greater than a data storage rate of a target storage device;

compressing the data stream at a compression ratio which provides a data compression rate that is greater than the data storage rate; and

storing the compressed data stream in the target storage device.

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2.   The program storage device of claim 1, wherein the compression ratio is at least equal to the ratio of the input data transmission rate to the data storage rate so as to provide continuous storage of the input data stream at the input data transmission rate.

15   3.   The program storage device of claim 1, further including instructions for performing the steps of:

determining the input data transmission rate and the data compression rate;

comparing the input data transmission rate, the data compression rate and the data storage rate to determine if they are compatible; and

20   adjusting one or more parameters to obtain compatibility between the input data transmission rate, the data compression rate and the data storage rate, if they are determined to be incompatible.

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4.   The program storage device of claim 3, wherein the instructions for performing the adjusting step include instructions for performing one of adjusting the input data transmission rate, adjusting the compression ratio and a combination thereof.

5.   The program storage device of claim 4, wherein the instructions for performing the adjusting step further include instructions for temporarily buffering one of the input data stream, the compressed data stream, and a combination thereof.

6.   The program storage device of claim 1, further including instructions for performing the steps of:

retrieving the compressed data stream from the target storage device at a rate equal to a data access rate of the target storage device; and

decompressing the compressed data at a decompression ratio to provide an output data stream having an output transmission rate which is greater than the data access rate of the target storage device.

7.   The program storage device of claim 6, wherein the decompression ratio is equal to the ratio of the data access rate to the input data transmission rate so as to obtain an output data transmission rate which is equal to the input data transmission rate.

8.   The program storage device of claim 6, wherein the decompression

ratio is equal to or greater than the ratio of the data access rate to a maximum accepted

output data transmission rate so as to provide a continuous and optimal data output

transmission rate.

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9.   The program storage device of claim 6, further including

instructions for performing the steps of:

determining the data retrieval rate and the data decompression rate;

comparing the data retrieval rate, the data decompression rate and the

10   output data transmission rate to determine if they are compatible; and

adjusting one or more parameters to obtain compatibility between the data

retrieval rate, the data decompression rate and the output data transmission rate if they are

determined to be incompatible.

15   10.   The program storage device of claim 9, wherein the instructions for

performing the adjusting step include instructions for performing one of adjusting the

data retrieval rate, adjusting the decompression ratio, and a combination thereof.

11.   The program storage device of claim 9, wherein the instructions for

20   performing the adjusting step include instructions for temporarily buffering one of the

retrieved data stream, the decompressed data stream, and a combination thereof.

12.   The program storage device of claim 6, wherein the input data

stream and the compressed data stream retrieved from the target storage device comprise

one of a single data block and a plurality of data blocks.

13.   The program storage device of claim 12, wherein the instructions

for performing the compression step include instructions for performing the steps of:

(a) compressing an input data block with a plurality of encoders to provide

a set of encoded data blocks;

(b) determining a compression ratio for each of the encoded data blocks;

(c) comparing each compression ratio with an *a priori* specified

compression threshold;

(d) selecting for output an encoded data block in the set having the highest

compression ratio and appending a corresponding descriptor, if at least one of the

compression ratios exceeds the *a priori* specified compression threshold; and

(e) repeating steps (a) through (d) for each successive input data block.

14.   The program storage device of claim 13, further including

instructions for selecting for output the input data block and appending a null descriptor

to the input data block is all of the compression rations of the corresponding encoded data

blocks fall below the *a priori* compression limit

15.   The program storage device of claim 13, wherein the instructions for the compressing step include instructions for simultaneously compressing the data block with a plurality of encoders in parallel.

16.   The program storage device of claim 13 wherein the instructions for performing the compressing step include instructions for sequentially compressing the data block with the plurality of encoders.

17.   The program storage device of claim 12, wherein the instructions for performing the decompressing step include instructions for performing the steps of:

(a) extracting an encoding type descriptor from an input data block;

(b) decompressing the data block in accordance with a decoder corresponding to the extracted descriptor; and

(c) repeating steps (a) and (b) for each successive input data block.

18.   The program storage device of claim 17, further including instructions for outputting the input data block if the extracted descriptor is a null descriptor.

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19.   A system for accelerating the rate of data storage and retrieval of a

data storage device, comprising:

means for receiving a data stream having an input data transmission rate

which is greater than a data storage rate of the data storage device; and

5   means for compressing the data stream at a compression ratio which

provides a data compression rate that is greater than the data storage rate; and

means for storing the compressed data stream in the data storage device.

20.   The system of claim 19, wherein the compression ratio is at least

10   equal to the ratio of the input data transmission rate to the data storage rate so as to

provide continuous storage of the input data stream at the input data transmission rate.

21.   The system of claim 19, further comprising:

means for receiving the compressed data stream from the storage device at

15   a rate equal to a data access rate of the storage device; and

means for decompressing the compressed data at a decompression ratio

that provides an output data stream having an output transmission rate which is greater

than the data access rate of the storage device.

20   22.   The system of claim 21, wherein the decompression ratio is equal

to the ratio of the data access rate to the input data transmission rate so as to obtain an

output data transmission rate which is equal to the input data transmission rate.

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23. The system of claim 13, wherein the data storage device is random access memory (RAM) device.

24. The system of claim 13, wherein the data storage device is one of a magnetic disk mass storage device, an optical mass storage device, a chemical mass storage device, and a combination thereof.

25. The system of claim 15, further including a data storage interface device for converting the compressed data stream to a format suitable for storage in the storage device and for converting the stored compressed data to a format suitable for decompression.

26. The system of claim 13, wherein the input data stream is a video data stream received from a video data processing system operatively connected to the receiving means.

27. The system of claim 15, further including a display controller system operatively connected to the decompression means, wherein the output data stream comprises a video data stream for processing by the display controller system.

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28. The system of claim 19, further including an input/output controller system having a plurality of input/output ports, operatively connected to the compression means, wherein the input data stream comprises one of serial digital data, parallel digital data, analog data, and a selected combination thereof.

29. The system of claim 21, further including an input/output controller system having a plurality of input/output ports, operatively connected to the decompression means, wherein the output data stream comprises one of serial digital data, parallel digital data, analog data, and a selected combination thereof.

30. A method for providing accelerated data storage and retrieval, comprising the steps of:

receiving a data stream at an input data transmission rate which is greater than a data storage rate of a target storage device;

compressing the data stream at a compression ratio which provides a data compression rate that is greater than the data storage rate; and

storing the compressed data stream in the target storage device.

31. The method of claim 30, wherein the compression ratio is at least equal to the ratio of the input data transmission rate to the data storage rate so as to provide continuous storage of the input data stream at the input data transmission rate.

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32. The method of claim 30, further including the steps of:

determining the input data transmission rate and the data compression rate;

comparing the input data transmission rate, the data compression rate and

the data storage rate to determine if they are compatible; and

5   adjusting one or more parameters to obtain compatibility between the

input data transmission rate, the data compression rate and the data storage rate, if they

are determined to be incompatible.

33. The method of claim 32, wherein the adjusting step includes one of

10   adjusting the input data transmission rate, adjusting the compression ratio, and a

combination thereof.

34. The method of claim 32, wherein the adjusting step includes

temporarily buffering one of the input data stream, the compressed data stream, and a

15   combination thereof.

35. The method of claim 30, further including the steps of:

retrieving the compressed data stream from the target storage device at a

rate equal to a data access rate of the target storage device; and

20   decompressing the compressed data at a decompression ratio to provide an

output data stream having an output transmission rate which is greater than the data

access rate of the target storage device.

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36.   The method of claim 35, wherein the decompression ratio is equal to the ratio of the data access rate to the input data transmission rate so as to obtain an output data transmission rate which is equal to the input data transmission rate.

37.   The method of claim 35, wherein the decompression ratio is equal to or greater than the ratio of the data access rate to a maximum accepted output data transmission rate so as to provide a continuous and optimal data output transmission rate.

38.   The method of claim 35, further including the steps of:

determining the data retrieval rate and the data decompression rate;

comparing the data retrieval rate, the data decompression rate and the output data transmission rate to determine if they are compatible; and

adjusting one or more parameters to obtain compatibility between the data retrieval rate, the data decompression rate and the output data transmission rate if they are determined to be incompatible.

39.   The method of claim 38, wherein the adjusting step includes one of adjusting the data retrieval rate, adjusting the decompression ratio, and a combination thereof.

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40. The method of claim 38, wherein the adjusting step includes

temporarily buffering one of the retrieved data stream, the decompressed data stream, and

a combination thereof.

5   41.   The method of claim 35, wherein the input data stream and the

compressed data stream retrieved from the storage device comprise one of a single data

block and a plurality of data blocks.

          42.   The method of claim 41, wherein the compression step includes the

10   steps of:

          (a) compressing an input data block with a plurality of encoders to provide

a set of encoded data blocks;

          (b) determining a compression ratio for each of the encoded data blocks;

          (c) comparing each compression ratio with an *a priori* specified

15   compression threshold;

          (d) selecting for output an encoded data block in the set having the highest

compression ratio and appending a corresponding descriptor, if at least one of the

compression ratios exceeds the *a priori* specified compression threshold; and

          (e) repeating steps (a) through (d) for each successive input data block.

43.   The method of claim 42, further including the step of selecting for output the input data block and appending a null descriptor to the input data block is all of the compression rations of the corresponding encoded data blocks fall below the *a priori* compression limit

44.   The method of claim 42, wherein the compressing step includes the step of simultaneously compressing the data block with a plurality of encoders in parallel.

45.   The method of claim 42 wherein the compressing step includes the step of sequentially compressing the data block with the plurality of encoders.

46.   The method of claim 41, wherein the decompressing step includes the steps of:

(d) extracting an encoding type descriptor from an input data block;

(e) decompressing the data block in accordance with a decoder corresponding to the extracted descriptor; and

(f) repeating steps (a) and (b) for each successive input data block.

47.   The method of claim 46, further including the step of outputting the input data block if the extracted descriptor is a null descriptor.

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